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Geographies of Knowledge Formation in Mega City-Regions: Some Evidence from the Dutch Randstad

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Abstract

An important source of competitiveness for mega city-regions results from their capacity to combine a strong local knowledge capital base with high levels of connectivity to similar regions elsewhere in the global economy. Globally networked advanced producer services firms are presumed to play a key role in transferring knowledge between local and global circuits. But how does this actually work? Which kinds of knowledge may be acquired through global networks and which others not? An in-depth analysis of the practices of knowledge production by advanced producer services firms in the mega city-region of the Randstad provides some answers.

Keywords: Mega city-regions, knowledge relationships, advanced producer services, multi-office firms, regional competitiveness, the Randstad

JEL codes: D21, D83, F23, L8

Des géographies de la formation de la connaissance dans des mégalopoles:
des preuves provenant de la Hollande Randstad

Lambregts

Une source importante de compétitivité pour les mégalopoles provient de leur capacité à combiner une base de connaissance locale forte avec des niveaux de connectivité aux regions similaires quelque part ailleurs dans l'économie mondialisée. Les sociétés de services avancés

à l'industrie qui sont en réseau sur le plan mondial sont censées jouer un rôle clé dans le transfert de la connaissance entre des circuits locaux et mondiaux. Mais il faut se poser les questions suivantes. Comment est-ce que cela se déroule dans la réalité? Quelle connaissance est-ce que on peut ou est-ce qu'on ne peut pas acquérir par le canal des réseaux mondialisés? Une analyse approfondie des méthodes de production de la connaissance par les sociétés de services avancés à l'industrie situées dans les mégalopoles de la Randstad fournit quelques réponses.

Mégalopoles / Rapports de connaissance / Services avancés à l'industrie / Sociétés à bureaux multiples / Compétitivité régionale / Randstad

Classement JEL: D21; D83; F23; L8

Geografien der Wissensbildung in Megastadtregionen: Belege aus der Randstad in Holland

Bart Lambregts

Abstract

Ein wichtiger Faktor der Wettbewerbsfähigkeit von Megastadtregionen liegt in ihrer Kapazität begründet, eine starke lokale Wissenskapitalbasis mit einem hohen Maß an Verknüpfung mit ähnlichen Regionen an anderen Orten der globalen Wirtschaft zu kombinieren. Es wird angenommen, dass weltweit vernetzte Wirtschaftsdienstleister bei der Übertragung von Wissen zwischen lokalen und globalen Kreisläufen eine zentrale Rolle spielen. Doch wie funktioniert dies in der Praxis? Welche Arten von Wissen lassen sich über globale Netzwerke erwerben und welche anderen nicht? Eine intensive Analyse der Praktiken der Wissensproduktion durch Wirtschaftsdienstleister in der Megastadtregion Randstad liefert einige Antworten.

Keywords:
Megastadtregionen
Wissensbeziehungen
Wirtschaftsdienstleistungen
Firmen mit mehreren Filialen
Regionale Wettbewerbsfähigkeit
Randstad
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Geografías de la formación de conocimiento en las regiones mega-ciudad: algunos ejemplos del Randstad en Holanda

Bart Lambregts

Abstract

Un factor importante de la competitividad de las regiones mega-ciudades radica en la capacidad de combinar una base sólida de capital de conocimientos locales con altos niveles de conectividad para regiones similares en otras partes de la economía global. Se supone que las empresas de los servicios avanzados de productores con redes en todo el mundo desempeñan un papel fundamental en transferir conocimientos entre circuitos locales y globales. Pero ¿cómo funciona esto en la práctica? ¿Qué tipos de conocimientos podrían adquirirse a través de redes globales y cuáles no? Un análisis exhaustivo de los métodos de producción de conocimientos

por parte de empresas de servicios avanzados al productor en la región mega-ciudad de Randstad nos ofrece algunas respuestas.
Keywords:
Regiones mega-ciudad
Relaciones de conocimiento
Servicios avanzados de productores
Empresas con varias oficinas
Competitividad regional
El Randstad

JEL codes: D21, D83, F23, L8

INTRODUCTION

In today's knowledge intensive economy, the competitiveness of regions is highly dependent on the capacity of actors located within them to generate leading edge knowledge. In generating state-of-the-art knowledge, however, no city or region can be constantly self-supporting. No matter how 'knowledgeable' and creative a region's economic agents are, it is rather likely that elsewhere in the world particular pieces of new and valuable knowledge are formed either just a little bit earlier or in just a slightly more advanced form. Regions that combine a strong local knowledge capital base (sustained by a healthy 'local buzz') with high levels of connectivity to similar regions elsewhere in the global economy ('global pipelines') are best off in this matter (SIMMIE, 2003; BATHELT et al., 2004).

Global or mega city-regions (from here referred to as MCRs), in their capacity as 'basic motors of the global economy' (SCOTT, 2001, p.4), should have such qualities almost by definition. After all they stand out as regional accumulations of (economic) mass and opportunity and they are typically very well tied into the global economy (SCOTT et al., 2001; HALL and PAIN, 2006). Their local knowledge bases should be rich enough to fuel a continuous process of leading edge knowledge formation and the myriad external relationships maintained by their many internationally oriented and globally networked firms should ensure that new and valuable bits of knowledge created elsewhere quickly find their way to these regions as well.

MCRs' external knowledge relationships may be maintained by a variety of (economic) actors, including universities and research institutes, governmental agencies and firms. Advanced producer services firms [endnote no. 1] form a particularly interesting category among these. After all, advanced producer services (from here referred to as APS) have over the past three decades rapidly evolved into a very central and highly knowledge-intensive feature of today's post-industrial economy and the firms have emerged as active agents in the creation and circulation of knowledge in local and regional economies (COFFEY, 2000; SASSEN, 2001; Wood, 2002;

UNCTAD, 2004). In many of Europe's most urbanised regions, APS now make up 15 to 30 percent of the local employment base with the highest scores reached in such typical MCRs as South East England, the Paris region, the Brussels Capital Region and the Dutch Randstad (EUROSTAT, 2006; RUBALCABA and GAGO, 2003). The APS firms find in MCRs the human resources and the client base that they so critically need and through their active role in investment, innovation and technical change, the firms actively facilitate the continuous adaptation of the MCR's production system. Moreover, the 'global players' among the APS firms through their transnational office networks maintain a great many of relations with other centres of knowledge creation all over the world (TAYLOR, 2004) and as such may be conceived as – at least potentially – strongly constitutive to MCRs' external knowledge linkages.

Yet, while such notions may sound rather straightforward, they are in principle not much more than a set of interconnected ideas and assumptions. There is empirical support for parts of it (e.g. APS firms do tend to concentrate in large urban agglomerations or MCRs), but less so for others (cf. COE, 2003). Much remains to be explored. Unanswered questions include those about the extent to which APS firms' transnational office networks are

used indeed for the exchange of knowledge, the kinds of knowledge that are typically acquired and exchanged through these networks, the kinds of knowledge of which the acquisition is typically a local affair, and the ways in which intra- and extra-regional knowledge circuits interconnect. These are the questions that occupy centre stage in this article and they will be addressed by looking at the knowledge exchanging activities of internationally networked APS firms in the Dutch MCR of the Randstad. The Randstad is Europe's fourth or fifth regional economy measured by gross regional product, a major APS stronghold, and a particularly multifaceted and well-connected space economy (LAMBREGTS et al., 2006; TAYLOR, 2002), and as such makes an interesting case. The analysis is meant to contribute to our understanding of how a key group of economic actors organises its knowledge practices and by means thereof helps MCRs to stay at the forefront of knowledge developments.

The article is structured as follows. Section 2 digs deeper into the relationship between knowledge and geography. It briefly discusses some of the key literature dealing with knowledge generating practices in regional contexts and takes due note of some recent contributions that emphasise the importance of relational as opposed to spatial proximity in the theorization

of knowledge formation. Next, we take note of the dynamics of knowledge formation in transnational multi-office firms, borrowing from such disciplines as international business studies and organisational sciences. In the fourth section, the specific knowledge needs of APS firms are identified and transformed into a typology of knowledge domains relevant to APS firms. This typology structures the empirical analysis of the knowledge practices of multi-office APS firms in the Randstad. This analysis, which takes up the fifth section, draws from the insights gained through some 64 in-depth interviews with Randstad-based APS firms. The article concludes with a discussion of the implications for theory and policy.

FROM SPATIALLY BOUNDED TO TRANS-SCALAR GEOGRAPHIES OF KNOWLEDGE CREATION

In 2005, businesses in the Randstad were responsible for 32 percent of R&D performed in the Netherlands (STATISTICS NETHERLANDS, 2007). The Netherlands as a whole at that time conducted no more than one percent of world R&D (OECD, 2007). For the Randstad this means that the ratio between R&D performed within and beyond its boundaries is close to 1:300. Even if all of the region's businesses would qualify as extremely alert and advanced, it

is still rather likely that valuable pieces of knowledge in many cases are developed just a little bit earlier or in a slightly more advanced form somewhere else in the Netherlands or, more likely even, elsewhere in the world. And with the share of non-OECD countries in the production of world R&D having increased from eight to twenty percent between 1995 and 2006 (OECD, 2007), the importance of such places 'elsewhere in the world' will probably only increase in the years to come.

This example serves well to illustrate that few cities or regions, not even a substantial regional economy as the Dutch Randstad , can assume to be fully self-supporting in terms of state-of-the-art knowledge creation. Claims like these have recently both been theorised (e.g. BATHELT et al., 2004) as well as tentatively empirically explored. For example, SIMMIE (2002, 2003) indeed finds a (positive) relationship between the innovativeness of firms and the reach of their networks and linkages. He argues that for the most innovative firms national and international customers are the most important sources of knowledge and concludes that '[a]s no region has a monopoly on new knowledge those that form nodes in national and international systems of knowledge exchanges benefit from both high levels of local knowledge capital and being the first to receive and decode new knowledge from other

similar nodes' (SIMMIE, 2003, p. 618). Obviously, and as noted by BATHELT *et al*. (2004) these benefits become more substantial as the agents that are actually involved in receiving and decoding this knowledge are better capable of transmitting the newly acquired knowledge to other actors operating in their direct surroundings.

The kinds of knowledge referred to in these arguments include both 'explicit' knowledge – to which access is becoming easier anyway – *and* 'tacit' knowledge. Tacit knowledge is the kind of knowledge that is 'person-embodied, context-dependent, spatially sticky and socially accessible only through direct physical interaction' (MORGAN, 2004, p. 12). It differs from explicit knowledge in that it 'is difficult to communicate effectively through written – and sometimes even verbal – form'; 'often resides in the unconscious realm of knowledge'; and is 'context-specific' (GERTLER, 2003, p. 105-106). The central idea is that it is formed relationally and that its formation and transmission depend on 'close and deep interaction' between parties who already share some basic similarities such as the same language; common codes of communication; shared conventions and norms; and personal knowledge of each other based on a past history of successful collaboration or informal interaction (ibid., p. 106). Explicit and tacit

knowledge are complementary categories. Often it needs tacit insights to meaningfully interpret explicit knowledge and it is often from the interaction between explicit and tacit knowledge that new knowledge is created (NONAKA et al., 2000). While 'a firm's ability to produce, access and control tacit knowledge' is widely considered to be 'most important to its competitive success' (GERTLER, 2003, p. 106), the question to what extent tacit knowledge can be transmitted and formed over longer distances and across boundaries is currently the subject of a lively debate.

Since the 1980s, an extensive body of literature has emerged on the spatiality of innovation and learning. Until recently, this literature was dominated by perspectives that see a strong link between knowledge diffusion and spatial proximity. Examples include knowledge-based theories of spatial clustering (e.g. MASKELL et al., 1998; MALMBERG and MASKELL, 2002), the learning regions thesis (e.g. MORGAN, 1997) and the systems of innovation literature (e.g. LUNDVALL and JOHNSON, 1994; COOKE et al., 1998). In a nutshell, these theories, each with its own emphasis, build upon the notion that the basic similarities referred to above are especially likely to emerge if the actors involved are part of the same spatially confined environment and thus have been shaped by the same unique combination of

socio-economic, cultural and institutional conditions – a factor emphasized by the systems of innovation literature notably – and thus are able to meet each other in person relatively frequently. Over time, such conditions may prove conducive to the (path-dependent) formation of (increasingly) distinct and localised 'ecologies' of knowledge formation that potential imitators in other regions may find very difficult to follow (GERTLER, 2003). A key characteristic of such ecologies is that they produce (assumedly) likewise spatially bounded knowledge spillovers. These are knowledge externalities that enable their beneficiaries 'to introduce innovations at a faster rate than rival firms located elsewhere' (BRESCHI and LISSONI, 2001) and as such have come to be seen as important determinants of local and regional competitiveness (MALMBERG and MASKELL, 2002) and an important agglomerative force (GORDON and MCCANN, 2000).

During the past decade or so, however, a growing number of authors have started to ask if these readings of the spatiality of knowledge diffusion and creation do not put too high a premium on spatial proximity (e.g. OINAS, 2000; COE and BUNNELL, 2003; AMIN and COHENDET, 2004; BATHELT et al., 2004; BOSCHMA, 2005). They share the concern that knowledge generating processes have come to be understood too narrowly as highly localised or

'island' activities and that 'internal links and/or "home-base" characteristics, distinguishable from external and distant or omnipresent forces' have come to be seen too selectively and partially as the main factors driving business creativity and performance (AMIN and COHENDET, 2004, p. 92). In response, these authors, each in his or her way, call for greater sensitivity to the existing variety of geographical contexts in which knowledge tends to be formed and circulated. While acknowledging: a) that the formation and sharing of (tacit) knowledge depends indeed primarily on the existence of 'thick' relationships in which people are able to 'internalize shared understandings or [...] translate particular performances on the basis of their own tacit and codified understandings' (ALLEN, 2000, p. 28); and b) that spatial proximity does actually increase the likelihood of regular encounters and the development of 'thick' relationships between actors; they also argue that 'geographical proximity per se is neither a necessary nor a sufficient condition for learning to take place' (BOSCHMA, 2005, p. 62). Support for this viewpoint comes from the 'communities of practice' literature (e.g. WENGER, 1998; WENGER and SNYDER, 2000), which contends that tacit knowledge 'may also flow across regional and national boundaries if organizational or "virtual community" proximity is close enough' (GERTLER,

2003, p. 106), and from increasingly credible indications that, enabled by ever more sophisticated means of communication and ease of travel, learning and knowledge sharing do in fact take place between persons or communities that are distant but linked through cultural, ideological, occupational or organisational affinities and ties (AMIN and COHENDET, 2004; COE and BUNNELL, 2003).

The geography of knowledge formation that results from these views is trans-scalar rather than made up of constructs implying a high degree of spatial boundedness (e.g. 'islands of innovation', 'clusters', 'districts'). For example, COE and BUNNELL (2003) consider the making of a priori presumptions as to how the configurations of knowledge generating network relations are spatially bounded simply unproductive. Instead they view innovation systems as 'combination[s] of intra-local, extra-local and transnational network connections, the exact balance of which is an empirical outcome that will vary from place to place, and sector to sector' (ibid., p.454). AMIN and COHENDET (2004, p. 93), likewise, envision knowledge practices as 'tracings in criss-crossing and overlapping networks of varying length and reach' so as to allow individual sites to be understood as 'node[s] of multiple knowledge connections of varying intensity and spatial distance'.

Below, while exploring the knowledge practices of APS firms in the Dutch Randstad such notions will be firmly kept in mind.

KNOWLEDGE CREATION AND THE TRANSNATIONAL MULTI-OFFICE FIRM

In the literature on the functioning of trans-scalar or 'stretched' knowledge relationships much attention is given to the knowledge practices of (transnational) multi-office firms. The latter are seen as organisational forms that pre-eminently facilitate practices of both 'decentred learning in local communities' and 'distanciated learning' across corporate space and, as such, may be suspected of playing an important role in interconnecting different regional innovation systems (COE and BUNNELL, 2003). While (transnational) multi-office firms are a heterogeneous lot, they all try hard 'to hold various knowledge architectures in place' and seek to achieve relational proximity across their distant sites 'through translation, travel, shared routines, talk, common passions, base standards, brokers, epistemic and community bonding, and the ordering and orientation provided by files, documents, codes, common software and so on' (AMIN and COHENDET, 2004, p. 96, 99).

This does not mean, however, that knowledge gets transferred and formed in such organisations without any resistance. Transnational corporations have gradually come to be seen as to owe their existence at least in part to their ability to transfer and exploit knowledge more efficiently than markets (GUPTA and GOVINDARAJAN, 2000) but it is also recognised that the barriers to knowledge transfer are many and substantial (e.g. KOGUT and ZANDER, 1993; FROST, 2001; SCHULZ, 2001; HANSEN, 2002). FOSS and PEDERSEN (2002), for example, consider the success of knowledge transfer to be a function of a) motivational factors; b) the existence and richness of transmission channels; c) the characteristics of the transferred knowledge (e.g. in terms of tacitness, ambiguity, context-relatedness) and d) the recipients' absorptive capacity. Motivational factors can work both against and in favour of effective knowledge transfer. Depending on a corporation's culture and the nature of the relationships between its individual units, units may either feel that they have something to lose (e.g. bargaining power, a competitive edge) by passing on knowledge to other subsidiaries or the headquarters or know that they will gain something if they manifest themselves as active knowledge transmitters (e.g. recognition, status, influence, knowledge shared by other returning the favour).

The knowledge creation process itself, in turn, has been carefully modelled by NONAKA et al. (2000). They view organisations as continuously concerned with creating and re-creating knowledge and define knowledge itself as dynamic, context-specific, humanistic and relational. Knowledge, after all, they argue: 'is created in social interactions amongst individuals and organisations', has meaning in a 'particular time and space' only, is 'essentially related to human action' and becomes valuable when it is 'interpreted by [...] and given a context and anchored in the beliefs and commitments of individuals' (ibid., p. 7). Knowledge creation is understood by these authors as a dynamic process shaped through the interactions between explicit and tacit knowledge. Such interactions lead to knowledge conversions of which NONAKA et al. (p. 9-10) identify four modes: socialisation; externalisation; combination; and internalisation. Socialisation refers to the process whereby tacit knowledge gets shared (e.g. through sharing experiences in communities of practice or through the interaction between client and producer in the production of a service) and converted to form new tacit knowledge. Externalisation concerns the process of articulating tacit knowledge into explicit knowledge, as for example happens in the presentation of new concepts in a product development process.

Combination is the process of converting 'basic' explicit knowledge into more complex and systematic sets of explicit knowledge. It includes such processes as the putting together of explicit knowledge from many different sources in one context and the further dissemination of the new knowledge product. Internalisation, finally, is the process where explicit knowledge is assimilated into tacit knowledge. It occurs when individuals make themselves familiar with pieces of explicit knowledge, reflect upon them and, as such, enrich their tacit knowledge base. According to NONAKA et al. (2000), the knowledge creating process is a continuous process of dynamic interactions and shifts between all these different modes of knowledge conversion, whereby knowledge transmissions may take place both within and beyond organisational boundaries.

APS FIRMS' KNOWLEDGE NEEDS

Knowledge is a heterogeneous resource and the empirical study of knowledge generating practices full of challenges (AMIN and COHENDET, 2004). The above two sections have already produced the insight that making a priori presumptions about the spatiality of knowledge generating practices may not be productive and that the occurrence of various modes of

knowledge conversion should be anticipated. In addition to this, the literature is riddled with different knowledge typologies (e.g. explicit versus tacit knowledge, individual versus collective knowledge, general knowledge versus specific knowledge), that may be of help to further direct an empirical analysis. Not all of these, however, are equally practicable for our purpose.

Our aim, once again, is to empirically explore the knowledge generating practices of (global) APS firms in the MCR of the Randstad. Such an analysis, it could be argued, should also be sensitive to the specific knowledge needs of such firms (cf. COE, 2003; LINDSAY et al., 2003). Much of the literature on knowledge and multinational organizations is tuned to the conditions pertaining to manufacturing firms. However, important organizational differences exist between these firms and their antipodes in the producer services domain. While global manufacturers typically roll out their value chains across the world in search of the right match between activity and locality, global services firms typically replicate (almost) the entire value chain in each city or country of operation (MOORE and BIRKINSHAW, 1998). Naturally, such differences also affect the knowledge generating practices in such firms. Whereas the various units of a global manufacturing firm are often engaged in distinct and highly specialised

(production and/or design) activities and, consequently, require and produce very specific knowledge inputs and outputs, the units of a global advanced producer services firm in many cases are involved in a much broader range of activities and therefore face a much wider set of knowledge needs. The knowledge concerns of, for example, a Dell or a Procter & Gamble global production facility in Malaysia (or any other country) are likely to remain confined mainly to issues relating to the management of the local production process, local regulatory and labour market conditions and local logistics, and not to spill into such fields as marketing and product development (since other Dell or P&G units take care of that). The latter is not true for services firms. A branch office of, for example, KPMG or Clifford Chance in Amsterdam (or any other city), in order to be able to successfully service the local market, not only needs to be familiar with local regulatory and labour market conditions, but also should know all about the workings of the local client market (marketing) and, in addition to that, make sure its service products continue to satisfy local preferences and needs (product development).

Generally speaking, the operations of a fully-fledged APS front-office can be divided into three 'activity packages': the acquisition of new business,

the actual delivery (production) of services, and the continuous anticipation of, adaptation to and exploitation of conditions produced by a variety of relevant environments. Performance in each of these fields depends largely on the extent to which these firms are successful in acquiring, internalising and using to their advantage the corresponding informations and knowledges. These can be boiled down to: (i) the knowledge required to successfully acquire new business; (ii) the knowledge required to keep the quality of the service products up-to-date; (iii) the knowledge that is required to optimally deal with the regulatory environment (the rules of the game); and (iv) a residual category reserved for knowledges relating to other environments in which the firm operates (e.g. the labour market). I will label these respectively: market-related knowledge, product-related knowledge, knowledge related to the regulatory context, and knowledge related to other contexts. Especially for market- and product-related knowledge it furthermore makes sense to distinguish between operational and strategic components. The operational components are essential for running daily operations. They are exemplified by such questions as: which business opportunities does the market currently offer, or how should service product X by adjusted to satisfy the needs of client Y. The strategic components, in

contrast, are crucial for the long-term competitiveness of the firm: what will 'tomorrow's' market conditions look like? Which product innovations should be anticipated given expected developments in, for instance, information technologies or clients' regulatory environment? For an APS firm to master these and other questions in a timely and adequate fashion requires the constant collection and processing of various kinds of explicit and tacit knowledge (as modelled by NONAKA et al., 2000; see the previous section). In the next section we explore how these processes work out for each of the knowledge categories identified and how they articulate in (and beyond) the space of the MCR of the Randstad.

KNOWLEDGE PRACTICES OF MULTI-OFFICE APS FIRMS IN THE RANDSTAD

At the start of this article it was argued that the global players among regions' advanced producer services firms may be strongly constitutive to such regions' external knowledge relationships. Armed with the insights developed above on the spatiality of knowledge diffusion/creation, the dynamics of knowledge creation in organisations, and the main knowledge domains APS firms need to master, it is now time to turn to the actual behaviour of these firms and try to find out exactly how they acquire and

create knowledge, and how these activities are articulated in space. This section draws from the insights gained through 64 in-depth interviews with Randstad-based APS firms held within the framework of the POLYNET project (see the introduction to this issue). In the summer and fall of 2004 these firms were asked about, among other things, the ins and outs of their knowledge practices. The semi-structured, face-to-face interviews were held with senior staff members (mostly executives) occupying key positions within the firms. The firms were selected for having multiple offices in various regions of which at least one should be located in the Randstad. The 64 firms (listed in Appendix 1) divide more or less equally across the eight APS industries adopted in the study (i.e. legal services, accountancy, financial services, insurance, ICT/management consultancy, advertising, design consultancy and logistics services). For a dozen of these firms, the office networks remained confined to the Netherlands. The networks of the other firms (more than 80 percent) were European and/or global in scope. The typology of APS knowledge needs developed in the previous section is used to organise this section, meaning that successively market-related, product-related, legal environment related and other knowledge needs pass in review.

For starters, however, the Randstad and its APS complex are briefly introduced.

Advanced producer services in the Randstad

The Randstad is the horseshoe-shaped urban configuration in the western part of the Netherlands. It roughly runs from Dordrecht and Rotterdam in the south, via The Hague and Leiden in the west to Amsterdam in the north and Utrecht and Amersfoort in the east. These cities surround a predominantly rural area called the 'Green Heart'. The area measures about 70km by 75km (16 per cent of the Dutch land area) and houses about 6.6 million people (40 per cent of the Dutch population). They live in a large number of mainly medium-sized cities and an even larger number of smaller towns and villages. At the beginning of 2007, the region included 12 cities with more than 100,000 inhabitants and another 13 in the range 70,000–100,000. The biggest cities are Amsterdam (743,000), Rotterdam (584,000), The Hague (474,000) and Utrecht (288,000). The co-presence of so many individual smaller and larger cities in a relatively small area gives the Randstad its archetypal polycentric appearance.

The Randstad is also the country's economic powerhouse. It is home to some 3.3 million jobs (47 percent of Dutch employment), most of them in various kinds of services. The main population centres and their surroundings are also the main job centres, with the exception of Schiphol airport, which has developed into a massive logistics and services centre of its own. The Randstad stands out as the Netherlands's most services-oriented region. At the end of 2005, 816,000 or 56 per cent of the country's jobs in financial and business services were located in the Randstad. Financial and business services accounted for 24 per cent of total employment in this region compared to 21 percent in the rest of the Netherlands (STATISTICS NETHERLANDS, 2008). Within the Randstad, the Amsterdam and Utrecht regions are particularly important business services strongholds. Here, the share of financial and business services in local employment is almost 30 percent.

The region is well-served by global APS firms. From the 100 global service firms identified by TAYLOR (2004) some 75 percent has a presence in the Randstad (LAMBREGTS et al., 2006). Most of these (almost 75 percent) have their Dutch headquarters in the Amsterdam region (ibid). Quite interesting, however, is the fact that many of these global APS firms service

the Randstad market through two (front) offices or more. In 2004, the sample of 177 multi-office and inter-regionally networked firms from which the interviewed firms were selected, together had at least 436 offices in the Randstad area (on average 2.5 per firm). Apparently, many such firms do not find it feasible to serve the entire Randstad from a single office (LAMBREGTS et al., 2006). Below we will see how this finding relates to the knowledge practices of these firms.

Market-related knowledge

The acquisition of operational market-related information for most (if not all) APS firms is an ongoing and vitally important process that is very much interwoven with the actual practice of acquiring new contracts itself. For the latter different models apply, but they have in common that a firm's chance of success strongly depends on the extent to which it has access to not publicly available information.

Tenders for service contracts are sometimes publicly advertised but more often they are not. In such cases the organisation in need of a service may either grant the work directly to its 'preferred supplier' (e.g. the bank, accountant, legal office or insurance company it usually works with), it may

follow the advice of a trusted contact (quite often one of the preferred suppliers just referred to) and grant the job (more or less) directly to another service supplier, or it may invite a small number of service suppliers to present a bid in competition. In each of these cases it is essential for service firms to be on the radar screen of as many as possible organisations belonging to or being associated with their target group(s), especially in times such organisations are planning to put out to tender. As many interviewees reported, the art is to become *and* remain 'preferred supplier' for particular clients and, in addition to that, to get short-listed and invited for tender procedures as often as possible. This is in part a matter of delivering good quality services, careful name building and keeping existing clients satisfied, but also a (never-ending) process of securing access to information that helps the service provider to undertake purposive actions aimed at winning new contracts. Such information is highly valuable and typically transmitted through personal, trust-based relationships. Such relationships are maintained by the service firm's individual employees, notably the customer-oriented among them. In their work and even beyond the latter are continuously concerned with the scope of their inter-personal networks and the quality of the individual ties. They are constantly, also

during weekends at the proverbial sports club, on the alert for useful information that may give them an (temporal) advantage over their competitors. Interviewees repeatedly emphasised that building and cultivating such trust-based networks with clients, former clients, potential clients, (occasional) partners, suppliers, people working in adjacent producer services branches, et cetera requires more or less frequent interpersonal, face-to-face encounters (be they organised or not). E-mail and telephone exchanges were considered useful for filling the spaces in between but not to suffice on their own. While at first sight the practice of acquiring operational market-related information may come across as a relatively straightforward information collection process, it actually concerns the employment of a deep (tacit) understanding of a market in order to secure access to exclusive information that is often distributed among a (very) few people only. As one Amsterdam-based accountant observed: "it is possible to serve a client in Maastricht [a provincial capital some 200 km south of Amsterdam] from Amsterdam without much trouble, but to acquire new business is a completely different story: you will need to be there for quite some time in order to become an insider and secure access to the right people and their

information, and thus become able to compete successfully with the local firms".

The interviews also learned that a trickle of useful 'inside' information on upcoming business opportunities travels between different offices of the same firm or a well-functioning alliance, but although some interviewees observed a gradual increase in the importance of such channels, their relevance was generally considered of secondary importance at best. The prevailing picture is clearly one whereby the acquisition of operational market-related knowledge for APS firms is very much a story of 'being there' – physically that is – and that it is notably this particular knowledge need that eventually leads APS firms to service the Randstad market through more than one office, if resources allow.

The story for strategic market-related knowledge, however, runs rather differently. For APS firms to prepare for 'tomorrow's' market conditions they need to familiarise themselves with a variety of local, national and global trends that may in the (near) future affect the volume and the nature of the demand, the place where demand will manifest itself most prominently, and the behaviour of competitors. While in the acquisition of operational market-related knowledge we chiefly see NONAKA et al.'s (2000) 'socialisation' and

'internalisation' modes of knowledge conversion at work (i.e. sharing tacit knowledge and converting explicit knowledge into tacit knowledge, see also above), the formation of strategic market-related knowledge rather involves a combination of the 'combination', 'internalisation' and 'externalisation' modes of knowledge conversion. From the firm's perspective it involves the collection and synthesis of various streams of mostly explicit knowledge ('combination'), the interpretation and further development of this knowledge with help of the firm's tacit understanding of its line of business and the local markets in which it operates ('internalisation'), and the articulation of the result into a knowledge product that can be shared throughout the firm ('externalisation'). Networked firms have typically introduced a division of labour between their units to perform this strategic knowledge activity, with headquarters or a dedicated subsidiary taking care of the identification and interpretation of the global trends and the (other) subsidiaries seeing to the translation of these insights to their national and/or local contexts. For the 'average' subsidiary, the office network of which it is part and the local and national contexts in which it operates constitute about equally important arenas from which strategic market-related knowledge gets abstracted and internalised. In geographical terms

this results in a rather more diverse and 'stretched' configuration of knowledge relationships than for operational market-related knowledge.

Product-related knowledge

APS firms are often hired to solve more or less unique problems that require highly customised solutions. Jobs may start with the (tentative) application of an 'off-the-shelf' solution but in many cases require considerable fine-tuning or even the development of a completely new product for the problem to be solved. New knowledge is likely to be produced along the way, with an important role set aside for the client itself. The latter, after all, possesses much of the (explicit and tacit) knowledge that the service provider needs to successfully deliver its service solution (see also BETTENCOURT et al., 2002).

Interviewees explained that the mobilisation of (operational) product-related knowledge often already starts during the making of a bid. This is still part of the business acquisition process and tends to happen at the office of the service firm. Depending on the complexity of the contract on offer, the making of the bid document may require intense communication between the makers and other experts. These experts are initially searched for within the office, but it may well be the case that they are only available

elsewhere in the firm (or even only outside the firm). Mobilisation of the knowledge of these experts is either facilitated through (as some interviewees were keen to show) sometimes very advanced virtual knowledge sharing devices or, if the potential gains associated with the contract are large enough, through flying in the expert(s) in person. In either way the bid makers benefit from the 'stretched' knowledge relationships that are available within the firm.

Once a work is granted, the actual production and delivery of the service begins. Here again, a variety of models can be identified. There are jobs in which a (team of) service provider(s) for a certain period of time is stationed at the client's to manage a particular process or design and implement a particular tool. Especially these kinds of jobs offer enable the service provider to acquire and take advantage of the tacit knowledge embedded in the client's organisation. There are also assignments, however, where most of the service production takes place in the office of the service firm and where producer and client just meet (or otherwise communicate) on a regular basis to discuss progress, share knowledge and make decisions. The nature of the product and the need for either 'inside' information or frequent intermediate consent from the client determines how intensive interaction during the

service production process is, which modes of communication are used and whether the bulk of the production takes place 'at the client's' or 'in-house'. Depending on the value attached to the job by both the client and the service provider, both parties may be willing to invest heavily in communication. Respondents referred frequently to jobs requiring frequent travel over large distances (e.g. weekly between Amsterdam and London or daily between different places in the Randstad) or the installation of quite extraordinary data-transmission devices (e.g. a dedicated satellite-based communication device to facilitate massive data transport between a Rotterdam-based service firm and its client in Beijing). Apart from these, the people working on a particular job of course have at their disposal the same possibilities to mobilise missing knowledge parts within and, if necessary, outside their firm environment as their 'bid making' colleagues referred to above.

After a job is finished, the knowledge that has been generated along the way is usually 'brought back' to the office where it may be enhanced (possibly by dedicated product or knowledge development divisions), filed and made accessible to the firm at large ('externalisation' in the words of NONAKA et al., 2000). The latter often happens with the help of the same (sometimes very advanced) virtual knowledge sharing devices mentioned

above, but traditional (intra-firm) face-to-face knowledge sharing meetings are also still in use and, reportedly, valued. Within a single office these may take the shape of monthly presentations over lunch while at the firm level thematic specialists may congregate once every so many months to discuss the latest (extra-firm) developments and (intra-firm) experiences within a particular field.

As far as operational product-related knowledge is concerned, other sources than the firm's client base and internal knowledge resources appear to be of secondary importance at best. Relationships with universities and other knowledge producing institutes do exist, but most respondents observed that these tend to serve junior staff recruitment rather than knowledge development objectives. In a similar vain, branch organisations and the like were considered useful for many things but not in particular for the formation of product-related knowledge.

Altogether, interactions with clients and other units within the firm appeared to be the most instrumental to a subsidiary's operational product-related knowledge formation. As the client base of the APS subsidiaries interviewed often appeared to be largely regionally defined (i.e. coinciding with the Randstad or parts thereof) and since the office networks they are

part of often spanned (large parts of) the world, the resulting geography of the knowledge relationships is typically multi-scalar with nearby and stretched relationships complementing each other.

Strategic product-related knowledge often gets developed in close relationship with and along the same lines as strategic market-related knowledge (discussed above). Insight in tomorrow's market demand enables and stimulates thinking about the matching service products. An important difference between the two processes seems to be that in the development of strategic product-related knowledge a slightly more important role is reserved for the subsidiaries. Service products are often 'cut to size' in order to be compatible with nationally defined socio-institutional and legal frameworks and practices. Their further development depends heavily on dedicated, hands-on knowledge of these national contexts and therefore is best done locally.

Knowledge related to the regulatory environment

Regulatory frameworks define the 'rules of the game' in a particular line of business. Such frameworks are frequently adjusted by the responsible legislative powers, usually only marginally, but every now and then also more

drastically (see for instance the recent regulatory changes affecting especially accountancy and management consultancy firms). An important development is that firms' operations are no longer affected only by the rules and regulations set up by national legislative bodies but increasingly also by those established by international bodies such as the EU and the US Securities and Exchange Commission. Even if firms do not strictly fall under the jurisdiction of a (foreign-based) legislative body, they may still feel the need to follow its rule in order to stay on a par with important international competitors. This means that the regulatory context for many APS firms (with sectoral differences) has become more complex over the years and probably will continue to do so in the years to come. Legal intelligence teams usually keep track of the international developments at the corporate level and translate ('internalise') their consequences for the firm as a whole. At the national level, subsidiaries are usually able to benefit from the services of professional bodies whose job it often is to translate national (as well as international) legislation into a set of workable directives for its member firms. Yet, there always remains some intelligence and translation work to be done within the firm/subsidiary itself as well. From a subsidiary's perspective, the key knowledge relations in this domain appear to be with the

corporate unit(s) responsible for keeping up to date with and internalising international regulatory changes and with the professional body (or bodies) that do the same at the national level, meaning that in geographical terms we are talking about both relatively nearby and stretched knowledge relationships.

Knowledge related to other contexts

Firms can further enhance their competitiveness by making sure that they are getting the best out of the local labour market, making the most of their office location, using to their best advantage the knowledge spillovers produced by the region, etcetera. Questions such as: 'which high-potentials currently working for competitors might be willing to make a career move'; 'how do we make sure that our new office will get 20 percent more parking places as set out in the local building code'; and 'which people are currently busy figuring out something that might come in handy if we want to enhance this product of ours', all require delicate intelligence procedures in order to be answered. As in the case of the acquisition of operational market-related knowledge (see above), such procedures rely heavily upon trusted interpersonal relationships and a sound understanding of the local

institutions, cultures and practices. The main knowledge conversion mode at work, to refer once more to the typology developed by NONAKA et al., (2000), is that of socialisation (sharing of tacit knowledge). The arenas across which such knowledge relationships stretch are typically quite tightly spatially bounded, perhaps more tightly even than those associated with the acquisition of market-related knowledge. Respondents mentioned that the kinds of knowledge referred to, are typically shared by befriended employees from different firms during non-office hours, for example while enjoying the pleasures of the local nightlife. Figure 1 provides a summary of the above.

Figure 1: Knowledge formation by multi-office APS firms in the Randstad: summary of findings

CONCLUSIONS AND IMPLICATIONS FOR REGIONAL POLICY

The above analysis of knowledge acquiring practices in multi-office APS firms in the Randstad puts flesh on the idea of MCRs qualifying as nexus of intra- and extra-regional knowledge relationships. The analysis shows that it is not possible to speak of *the* geography of knowledge production in APS in the Randstad but that there are, in line with some recent additions to the

literature on the spatiality of knowledge formation (e.g. AMIN and COHENDET, 2004; COE and BUNNELL, 2003) many such geographies indeed. The analysis has first of all revealed that in order to get a feel for the variety of geographies present, it is helpful to connect to the different knowledge domains that are central to APS operations. Introducing a distinction between market-related knowledge, product-related knowledge, knowledge related to the regulatory environment and knowledge related to other contexts proved to be very useful. Closer analysis of how and from where the firms tended to acquire such knowledges produced a composite picture in which highly localised knowledge relationships alternated and co-existed with relationships spanning larger distances. Locally defined circuits were found especially instrumental to the acquisition of operational market-related knowledge and a selection of more 'secundary' knowledge types (i.e. knowledge related to local labour market characteristics or the knowledge required to efficiently maintain an office in a particular place). It is the requirement of physically 'being there' in order to acquire operational market-related knowledge combined with the fact that the sources from which such knowledge should be acquired are scattered across the (polycentric) Randstad, that forces many APS firms to maintain various offices

in the area. For the other knowledge categories the picture appeared to be much more mixed with the 'stretched' knowledge relationships available within the firms' office networks complementing locally defined ones. Nearby and stretched knowledge relationships appeared to complement each other especially well in the formation of operational product-related knowledge and it is probably this category where the benefits of APS firms' 'external knowledge relationships' for the regional economy at large are most substantial. After all, it is through the actual delivery of services that APS firms let their knowledge spill into a regional economy and if this knowledge is kept 'state-of-the-art' by knowledge inputs from other advanced economies the regional economy should eventually notice the difference.

It should be noted of course, that our sample of interviewed firms was biased in the sense that all firms concerned (transnational) multi-office firms and that stretched knowledge relationships within such firms are more likely to occur than in other firms. Without doubt, the interviews as such have produced richer information on long-distance knowledge relationships than they would have done if the majority of the firms interviewed were single-office firms. However, since (transnational) multi-office firms do constitute a crucial part of the economies of MCRs and since they are, as observed by for

example COE and BUNNELL (2003, p. 450), among 'the main "connectors" between regional innovation systems in different national territories', the findings are of consequence in a discussion on regions' external relationships.

Fostering external knowledge relationships

These results should be of interest to regional policymakers not only in the Randstad but also beyond. If we follow MALMBERG's (2003, p. 159) suggestion that the quality of the local knowledge structure is to some extent 'a function of the quality of the global connections that the individual actors in the local milieu have collectively managed to develop', and if FOSS and PEDERSEN (2002, p. 95) are right in claiming that in dynamic, well-functioning transnational corporations one of the power-wielding assets is 'the dynamic capability to produce and transfer new knowledge' and that hence 'influence is likely to flow to a subsidiary that is able to continuously transfer knowledge to other subsidiaries', we have identified a powerful, potentially self-reinforcing mechanism that certainly deserves the attention of policymakers. Three areas of special interest can be distinguished.

The first is the level of external connectivity itself. External, knowledge-enhancing connections have to be initiated and maintained. Multi-office and transnational firms almost by definition maintain such relations, but the (large) majority of firms does not posses the means or does not aspire to become a (transnational) multilocational firm. A compromise is to become a member of a larger alliance or to initialise one. As there seems to be no upper limit to the benefits of 'being connected' for the region at large (BATHELT et al., 2004; but note that this is different for the individual firm, which is likely to reach a point where the costs of maintaining multiple connections start to outdo the benefits accruing from them), there may be a case for regional policymakers in encouraging individual firms to engage in knowledge-enhancing relations to actors operating in other 'centres of excellence'. Local or regional governments, possible together with professional associations, could for example think of promoting and facilitating international events for small and medium sized business in particular (as the larger firms have abundant possibilities and resources themselves) in the hope that these will yield new international (as well as intra-regional) connections.

Next to this, policy makers should also ask whether and how they can be of help to local offices that wish to defend and possibly strengthen their position in their respective firm networks. In the loosely structured, partly cooperative, partly competitive network forms that characterise most service transnationals (COE, 2003), many factors determine the relative position or centrality of a particular branch office. The firm's history frequently plays an important role, with essential power (and thus centrality) often remaining concentrated in one or more home country offices (e.g. headquarters). However, local offices may gain influence within the network if they stand out in some respect. Sales and profit margins are obvious power-wielding assets (with the larger and more profitable offices having a bigger say in the firm's concerns), but so is the capability of an office to produce and transmit new and valuable knowledge products to the firm at large (FOSS and PEDERSEN, 2002). An office that is able over time to build a reputation as an active 'knowledge provider' in some cases may even become (one of) the firm's 'knowledge centre(s)' in a particular field. In all cases, however, it is likely that the office's knowledge production results in more frequent and more intensive interactions with other offices. And while it is true that such interactions principally serve to 'export' the locally produced knowledge to

the network, they will also bring benefits in return (e.g. useful feedback, status and more). Since a local office's knowledge generating capacity depends at least partly on the quality of the local knowledge environment (the local 'buzz' in the words of BATHELT et al., 2004), it is here that policy support may be helpful. For policy interventions into the local knowledge environment to be effective it is crucial to identify which local knowledge sources are most productive to which type of industry (or segments thereof). For APS it has been argued that much of the most valuable product-related knowledge is created in producer-client relationships. The quality of the demand for services largely determines the extent to which service firms are challenged and stimulated to innovate (cf. PORTER, 1990; MOORE and BIRKINSHAW, 1998). Policy makers could consider to complement their traditional supply-side orientation with a demand-oriented approach and at least examine the opportunities they have to support the production of sophisticated demand for services. Such an approach could start with the identification of the actual producers of sophisticated demand for each and every relevant services subsector (as these may differ), and continue with addressing the question whether anything should and could be done to sustain (some of) them. An investigation like that is likely to find that larger

companies and multinational corporations (notably their headquarters) are typical producers of sophisticated demand for producer services, but it may well be the case that particular categories of small and medium-sized businesses appear on the radar screen as well (e.g. those operating in the vanguard of their fields where uncertainties are many and the need for specialized services possibly high). And whereas the former (i.e. the larger companies and multinationals) often already enjoy substantial policy attention, policymakers may find it opportune to develop an interest in the ins and outs and the particular needs of the latter as well. Finally, governments should not forget that they are themselves (key) producers of demand for business services as well and in some fields (e.g. architecture and engineering) capable of rendering 'regular' into 'sophisticated' demand.

The third and final area of interest for policymakers is – of course – the infrastructure that such firms require for the transmission and sharing of knowledge. The region's infrastructure should be able to adequately receive, accommodate, move around and send off the carriers of tacit knowledge disguised as travelling executives, project teams, specialists and the like. Frequent and direct flights to the world's major business/knowledge centres are an asset in this respect and the same goes for high-speed train

connections. Essential as well is the region's infrastructure for virtual communications. Here the difference is not so much made by the infrastructure that facilitates normal telephone and e-mail traffic (large parts of the world pretty much constitute a level playing field in this respect), but rather by the facilities and capacities that are required to support the most advanced information sharing systems and – in terms of bits and bytes – the most sizeable transmissions.

It is, to conclude, not the MCR's 'regional knowledge base' alone that deserves the attention of policymakers but also the region's external knowledge relations and their constituting factors. Sensitivity to sectoral peculiarities is essential: enhancing the knowledge creating capacities of manufacturing industries requires partly different tricks than the ones that might prove successful for advanced producer services.

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Note

1. Here defined as to include activities such as: legal services, accountancy, financial services, insurance, ICT/management consultancy, advertising, design consultancy and logistics services.

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Figure 1: Knowledge formation by multi-office APS firms in the Randstad: summary of findings

Knowledge categories	Market-related knowledge	Product-related knowledge	Knowledge related to the regulatory context	Knowledge related to other contexts
Operational	Formed mainly through myriad networks of mainly (but not exclusively) locally defined relationships	Formed mainly through myriad networks of mainly (but not exclusively) locally defined relationships (clients), complemented with varied inputs from the corporate network	Formed mainly through a small number of locally defined relationships and complemented by dedicated input from the corporate network	Formed mainly through myriad networks of quite strictly locally defined relationships
Strategic	Formed by dedicated input from the corporate network combined with in-house knowledge of local conditions	Formed by in-house knowledge of local conditions combined with dedicated input from the corporate network		